

CLAIMS

1. An automatic open-close device for a vehicle that has an open-close component attached to the vehicle so as to freely open and close and a driving unit that drives the open-close component and a control unit that controls the driving unit, and automatically opens and closes the open-close component, the device comprising:

a stop state detecting unit that detects a stop state of the open-close component that stops in an intermediate position between its fully opened position and its fully closed position thereof;

a low driving force mode setting unit that operates the driving unit by low driving force, when the stop time detecting unit detects that the open-close component stops in the intermediate position between the fully opened position and the fully closed position thereof; and

an automatic open-close mode setting unit that makes the open-close component automatically open and close, when the move speed of the open-close component in the low driving force mode becomes a specified speed or higher within a specified time; wherein

when the vehicle is inclined in the open-close direction of the open-close component, the open-close component is automatically operated toward the downward side of the inclination.

2. The automatic open-close device for a vehicle according to claim 1, wherein in the low driving force mode, even when the driving unit is operated in either the opening direction or the closing direction, if the move speed of the open-close component is not the specified speed or higher within a specified time, the driving unit is operated in the other direction of either the opening direction or the closing direction.

3. The automatic open-close device for a vehicle according to claim 2, wherein when the driving unit in the low driving force mode cannot make the open-close component reach a specified speed or higher within a specified time in either the opening direction or the closing direction, the driving unit is stopped.

4. The automatic open-close device for a vehicle according to claim 1, wherein when the vehicle is at level, the driving force of the driving unit in the low driving force mode is set to a level insufficient to move the open-close component.

5. The automatic open-close device for a vehicle according to claim 1, wherein when the vehicle is inclined in the open-close direction of the open-close component, the driving force of the driving unit in the low driving force mode is set to a level enough to slightly support the movement of the open-close component toward the downward side of the inclination.

6. The automatic open-close device for a vehicle according to claim 1, further comprising a clutch arranged between the open-close component and the driving unit, and a clutch control unit that keeps the clutch in its connected status when the open-close component is at the intermediate position, and sets the clutch in its disconnected status when the open-close component is at the fully opened position or the fully closed position, and sets the clutch in its disconnected status when the open-close component is not made to reach a specified speed or higher within a specified time in either the opening direction or the closing direction in the low driving force mode.

7. The automatic open-close device for a vehicle according to claim 2, further comprising a clutch arranged between the open-close component and the driving unit, and a clutch control unit that keeps the clutch in its connected status when the open-close component is at the intermediate position, and sets the clutch in its disconnected status when the open-close component is at the fully opened position or the fully closed position, and sets the clutch in its disconnected status when the open-close component is not made to reach a specified speed or higher within a specified time in either the opening direction or the closing direction in the low driving force mode.

8. The automatic open-close device for a vehicle according to claim 3, further comprising a clutch arranged between the open-close component and the driving unit, and a clutch control unit that keeps the clutch in its connected status when the open-close component is at the intermediate position, and sets the clutch in its disconnected status when the open-close component is at the fully opened position or the fully closed position, and sets the clutch in its disconnected status when the open-close component is not made to reach a specified speed or higher within a specified time in either the opening direction or the closing direction in the low driving force mode.